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Relationship between carbohydrate changes in pseudobulbs and flowering in *Onicdesa* Gower Ramsey 'Honey Angel'

Hsi Lin and Yao-Chien Alex Chang*

Department of Horticulture and Landscape Architecture, National Taiwan University
Taipei, Taiwan

*Corresponding author email: alexchang@ntu.edu.tw

Oncidesa is an economically essential ornamental extensively used as a cut flower crop. The pseudobulbs are the main storage organs and strongly affect the growth and flowering of *Oncidesa*. However, the metabolism of carbohydrates in the pseudobulbs is still unclear. This study examined the storage and utilisation of carbohydrates from pseudobulb swelling to aging. We also investigated the relationship between flowering and carbohydrate dynamics in *Oncidesa* Gower Ramsey 'Honey Angel' pseudobulbs. At 100 days after the new shoot emerged, the pseudobulb expanded and was unsheathed from the leaf sheath. The developing pseudobulb accumulated glucose and fructose, accounting for 20% to 30% of its dry weight. At about 150 days, the pseudobulb matured and the inflorescence also elongated. During inflorescence development, the pseudobulb wrinkled and the sugars decreased in the pseudobulb. After flowering, the pseudobulb then stored a massive amount of starch, accounting for over 50% of its dry weight. The starch continued to accumulate for several growth cycles in the old pseudobulbs, supporting the growth of new shoots. The floral transition of *Oncidesa* is correlated to nutrient accumulation. According to our results, the floral transition occurred just before the unsheathing of the pseudobulb. Therefore, the starch stored in the old pseudobulbs determined the phase change of the inflorescence meristem. We conclude that the forms of carbohydrates in the pseudobulb change as it develops. The carbohydrates are mainly stored in the wrinkled old pseudobulbs and control the flowering of *Oncidesa*, while the sugars in the swelling new pseudobulb are immediately used for the development of the pseudobulb and inflorescence.

Keywords: floral transition, orchid, *oncidium* alliance, starch, total soluble sugars